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(54) Title: PEPTIDE LIGANDS OF DENDRITIC CELLS FOR NUCLEIC ACID VECTOR TARGETING

(57) Abstract: A peptide consisting of or comprising an amino acid sequence selected from a) Px¹X²X³T [SEQ.ID.NO.:1]; b) PSX⁴S [SEQ.ID.NO.:2]; c) QX⁵X⁶X⁷Q [SEQ.ID.NO.:3]; d) SX⁸S [SEQ.ID.NO.:4], in which X¹, X² and X³, which may be the same or different, each represents an amino acid residue; X² is preferably N or L; X⁴ represents an amino acid residue, preferably N or L; X⁵ and X⁷, which may be the same or different, each represents an amino acid residue, X⁶ represents an amino acid residue having an amide side chain; and X⁸ represent an amino acid having an aliphatic side chain, which peptide binds to dendritic cells and also to other types of cells. The peptide may be used a target non-viral and viral vectors to such cells.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB2004/002421

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/861 C07K7/06 A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	IVANENKOV VASILY V ET AL: "Targeted delivery of multivalent phage display vectors into mammalian cells" BIOCHIMICA ET BIOPHYSICA ACTA, AMSTERDAM, NL, vol. 1448, no. 3, 11 January 1999 (1999-01-11), pages 463-472, XP002157575 ISSN: 0006-3002	1-15, 30-107
Y	abstract; page 463, right-hand column, lines 3-6; table 1, third peptide	1-15, 30-107
X	WO 98/44121 A (MEHTALI MAJID ; LEGRAND VALERIE (FR); TRANSGENE SA (FR); BOULANGER PIE) 8 October 1998 (1998-10-08) abstract; Seq. ID 1; paragraph joining pages 4 and 5; page 10, lines 14-17; claims 3,6-8,29,33-34	1-15, 30-107

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

4 November 2004

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

 Intern: Application No
 PCT/GB2004/002421

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/057445 A (MURUGANANDAM ARUMUGAM ; STANIMIROVIC DANICA (CA); NARANG SARAM (CA); N) 25 July 2002 (2002-07-25) abstract; table 1, Seq. IDs 61,82; claims 44-47 -----	1-15, 30-107
X	WO 03/004646 A (O'MAHONY DANIEL J ; BRAYDEN DAVID (IE); BYRNE DARAGH (IE)) 16 January 2003 (2003-01-16) abstract; table 4, the 29th peptide on page 50 -----	1-15, 30-107
X	DE 198 45 251 A (UNIV EBERHARD KARLS) 9 March 2000 (2000-03-09) abstract; page 2, lines 21-29; Seq. IDs 1, 39 and 40 on pages 6-7 -----	1-15, 30-107
X	BOER J ET AL: "Design and synthesis of potent and selective alpha(4)beta(7) integrin antagonists" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY, WASHINGTON, US, vol. 44, 26 July 2001 (2001-07-26), pages 2586-2592, XP002214393 ISSN: 0022-2623 -----	1-15, 30-34
Y	abstract; page 2586, paragraph joining left- and right-hand columns; tables 1-2 -----	1-15, 30-83, 97-107
X	WO 03/008537 A (CTL IMMUNOTHERAPIES CORP) 30 January 2003 (2003-01-30) abstract; Seq. IDs 393,394,398,399,537,538 of table 1C. -----	1-15, 30-34
X	WO 91/18010 A (INST MEDICAL W & E HALL ; SWINBURNE LTD (AU); MACFARLANE BURNET CENTRE) 28 November 1991 (1991-11-28) abstract; table 2, 4th peptide -----	1-15, 30-34
Y	WO 98/54347 A (HART STEPHEN LEWIS ; INST OF CHILD HEALTH (GB)) 3 December 1998 (1998-12-03) cited in the application abstract; page 5, line 22 to page 10, line 15; claim 47 -----	1-15, 30-83, 97-107
Y	WO 02/072616 A (ICH PRODUCTIONS LTD ; WRITER MICHELE (GB); HART STEPHEN LEWIS (GB)) 19 September 2002 (2002-09-19) abstract; page 5, lines 2-7; examples 1-2; claims 21-81 -----	1-15, 30-107
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INTERNATIONAL SEARCH REPORT

Intern I Application No
PC1/GB2004/002421

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 01/58940 A (GENVEC INC) 16 August 2001 (2001-08-16) abstract; example 1; page 5, first paragraph; page 6, second paragraph, paragraph joining pages 6 and 7 -----</p>	
A	<p>PEREBOEV A V ET AL: "Coxsackievirus-adenovirus receptor genetically fused to anti-human CD40 scFv enhances adenoviral transduction of dendritic cells." GENE THERAPY. SEP 2002, vol. 9, no. 17, September 2002 (2002-09), pages 1189-1193, XP002303755 ISSN: 0969-7128 abstract; figures 1 and 3 -----</p>	

INTERNATIONAL SEARCH REPORT

Int

onal application No.
PCT/GB2004/002421

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 97, 99-101 and 108 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition. In particular, the method of claim 108 is to be considered as such because it can be carried out "in vivo".
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1 (partially), 2-15, 30-107 (partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ GB2004/ 002421

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1 (partially), 2-15, 30-107 (partially)

Peptides comprising the motif of Seq. ID 1 (i.e. PXXXT), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

2. claims: 1 (partially), 16-20, 30-107 (partially)

Peptides comprising the motif of Seq. ID 2 (i.e. PSXS), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

3. claims: 1 (partially), 21-25, 30-107 (partially)

Peptides comprising the motif of Seq. ID 3 (i.e. QXXXQ), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

4. claims: 1 (partially), 26-29, 30-107 (partially)

Peptides comprising the motif of Seq. ID 4 (i.e. SXS), compositions and medical uses thereof, as well as antibodies and methods for producing said compositions: transfection mixtures, complexes, vectors, kits,...

5. claim: 108

Method for the identification of siRNAs.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr

Application No

PC1/GB2004/002421

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern: 31 Application No
PCT/GB2004/002421

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